

# **Block Island Sound & Approach Areas - Right Whale Ship Strike Reduction Measures**

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# Goal Today

- **Brief overview of proposed measures**
- **Obtain industry input – comments, concerns, additional data to be considered, etc.**
- **NOAA Fisheries & US Coast Guard need your input!**

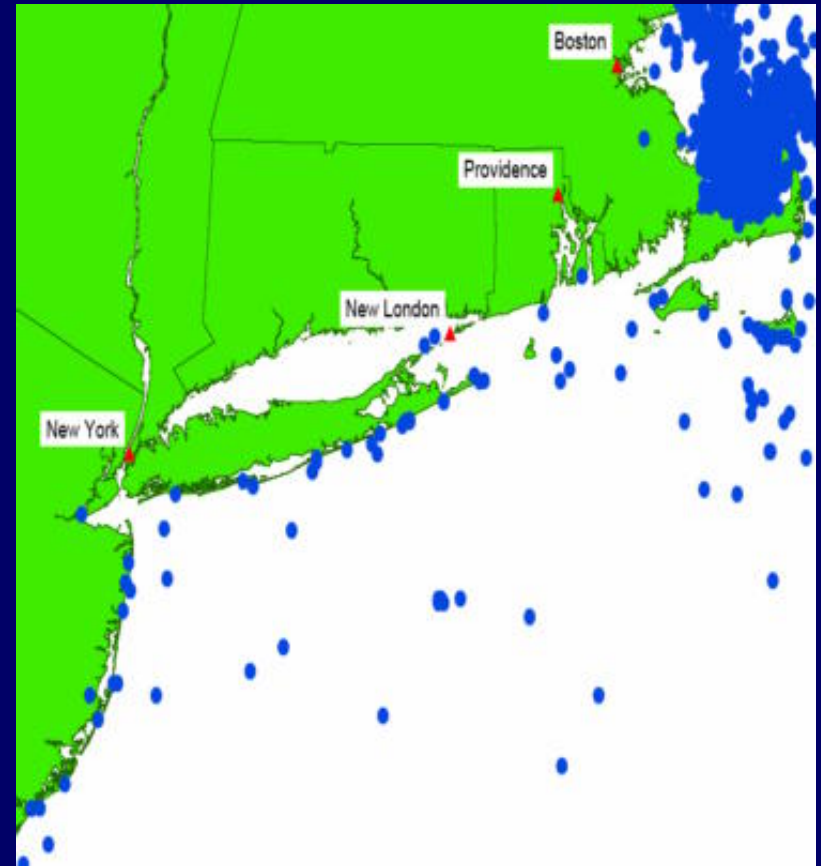
# Mid-Atlantic Region

- Area south & east of Block Island Sound, Rhode Island to Port of Savannah, Georgia
- Between known high use areas in NE & winter calving area in SE



# Right Whale Sightings

- Generally observed in waters relatively close to shore
  - 94% of sightings within 30 nm of shore



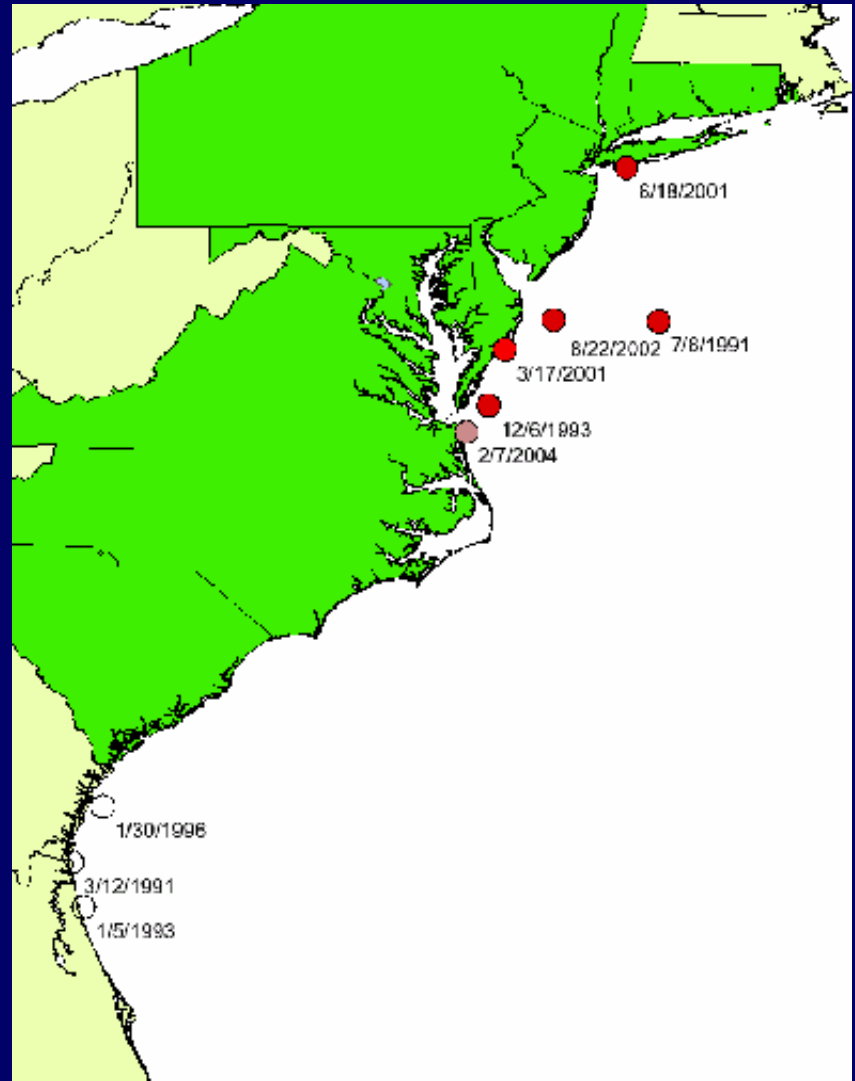
# Seasonal Use of Mid-Atlantic Region

- **Migratory Corridor for**
  - *Pregnant Females* moving from NE to SE in fall (Sept-Nov)
  - **Other Population Segments** – juveniles, males
  - **Mother/Calf pairs Departing Winter Calving Area in SE for NE Areas (March – May)**

# Mid-Atlantic Ship Strike Mortalities

## 1991 - 2002

- 5 of 14 confirmed ship strike mortalities in the mid-Atlantic
- 3 ship strike mortalities occurred in last 3 years
  - Assateague Island Mar 2001
  - Long Island, NY June 2001
  - Ocean City, MD Aug 2002
- “Stumpy” in Feb 2004?





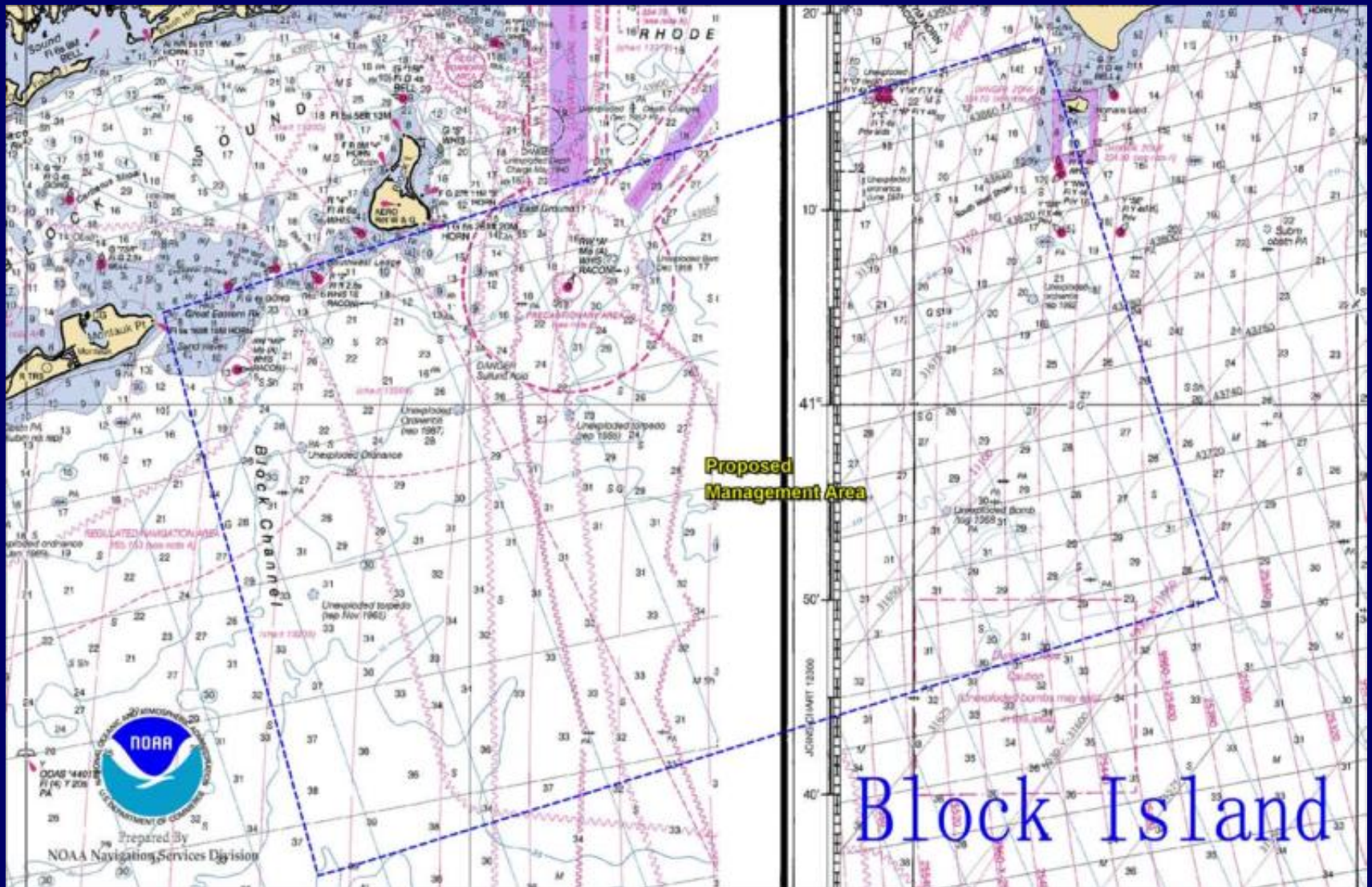
Right Whale Floater  
off Long Island June  
2001



# **Block Island Sound and Approaches Measures**

- **Seasonal Management Area (SMA)**
  - **Speed restrictions within the boxed area (30 x40 nm)**  
**--- 10 – 14 knots \***
  - **Applicable period March & April and September & October \* (~120 days/yr)**
- **Dynamic Management applicable outside period of SMA**
- **\*Distance, duration and speed subject to further analysis**





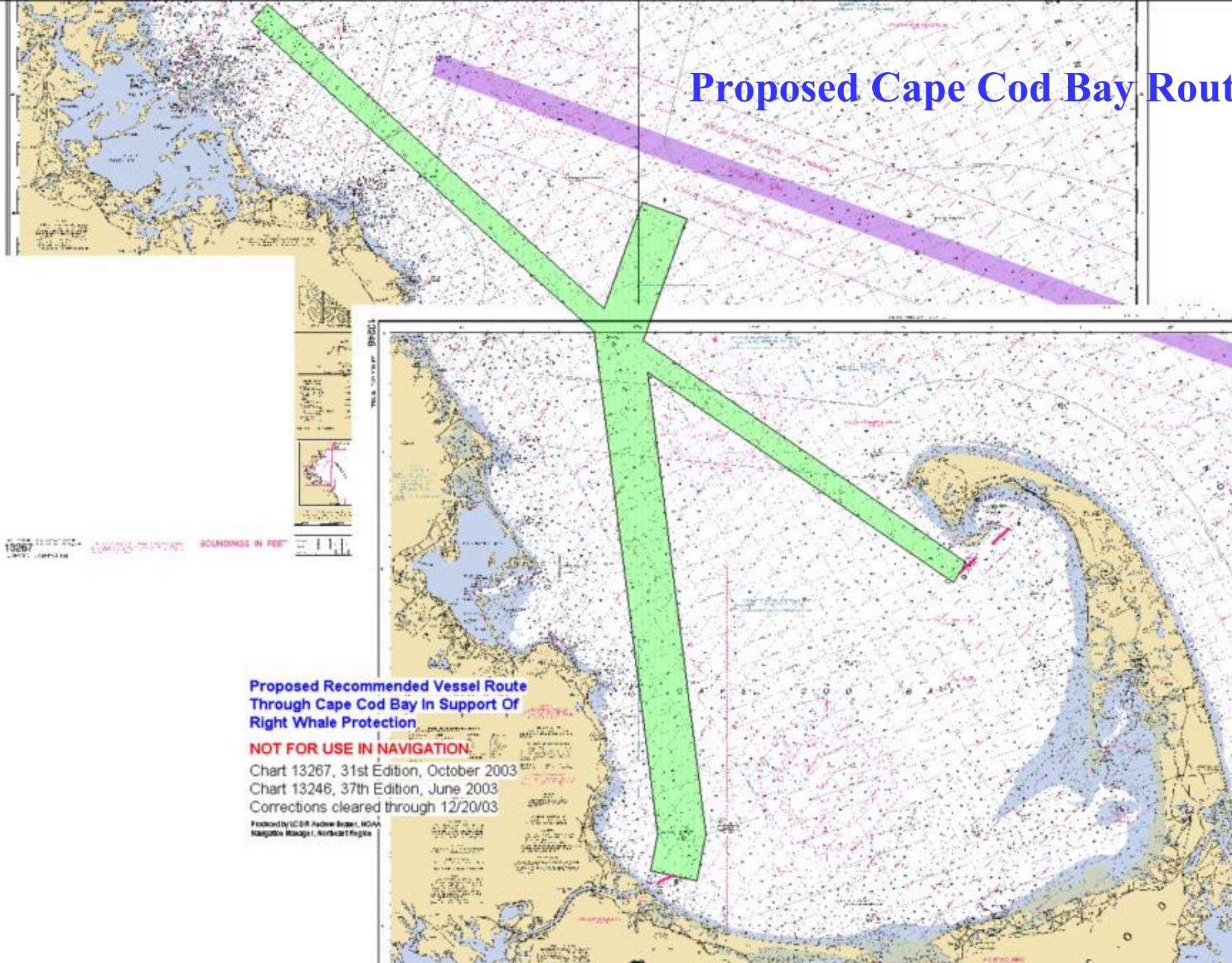
**Block Island Sound SMA – box approximately from  
Montauk Pt. To Gay Head , Martha's Vineyard**

# Cape Cod Bay Measures

- **Seasonal Management Area (SMA)**
- **Applicable period 1 January – 30 April \* (~120 days/yr)**
- **Area –entire Bay to western shoreline of Bay**  
(includes existing CCB Right Whale Critical Habitat)
- **Dynamic management applicable (yr round) outside period of SMA**
- **Ship route - Boston & ports North**
  - Western side of CCB & outside of critical habitat
  - Sufficient width to route around whales
- **Ship route - Provincetown**
  - Speed restrictions in lanes \* 10- 14 knots
    - Lift speed restrictions when “no” whales



# Proposed Cape Cod Bay Route



**Proposed Recommended Vessel Route  
Through Cape Cod Bay In Support Of  
Right Whale Protection**

**NOT FOR USE IN NAVIGATION**

Chart 13267, 31st Edition, October 2003

Chart 13246, 37th Edition, June 2003

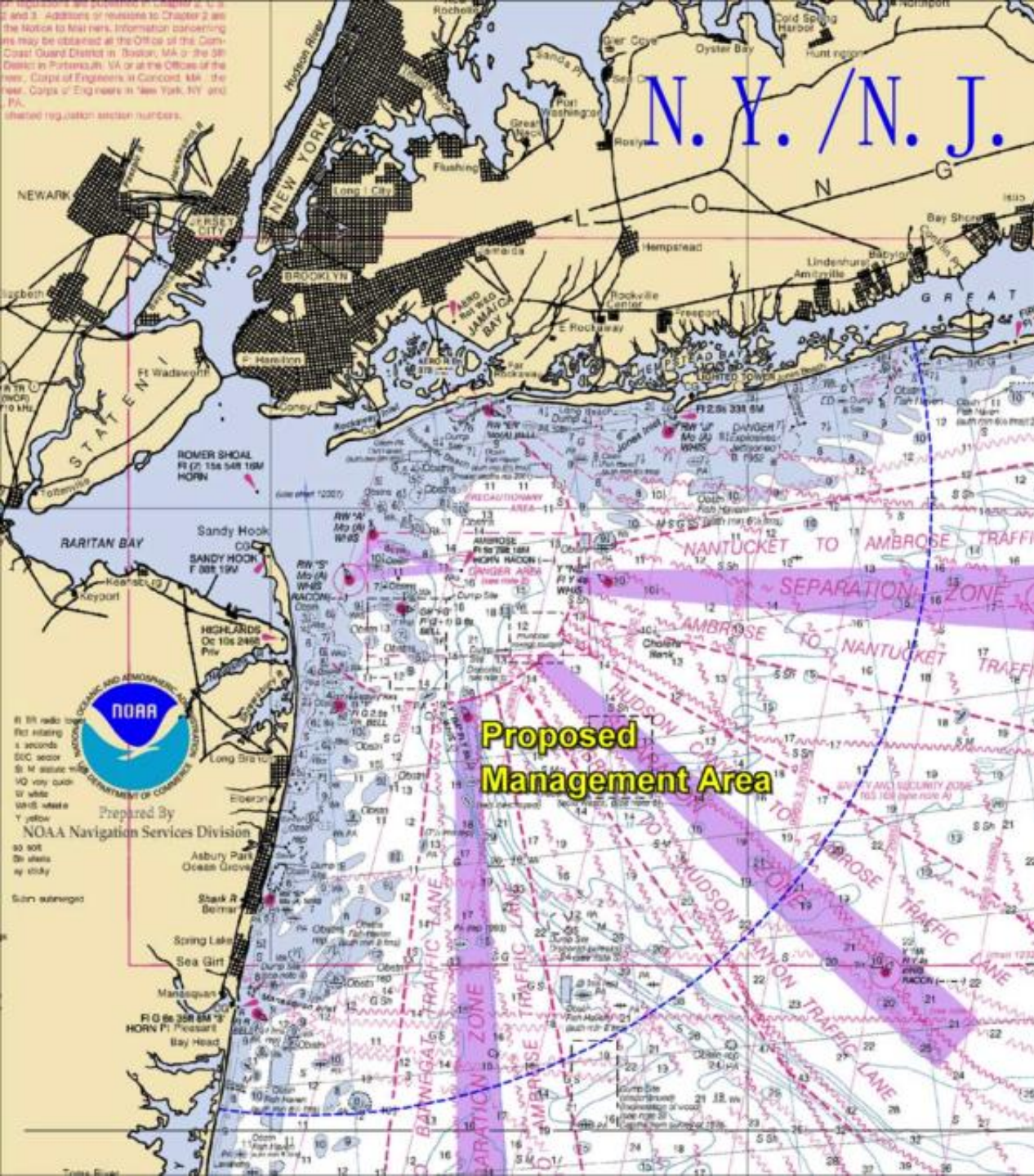
Corrections cleared through 12/20/03

Produced by USCG Andrew Brant, NOAA  
Navigation Manager, Northeast Region

# **Ports of New York & New Jersey Measures**

- **Seasonal Management Area (SMA)**
  - **Speed restrictions within 30 nm of the COLREGS line --- 10 –14 knots \***
  - **Applicable period February - April and September & October \* (~150 days/yr)**
- **Dynamic Management applicable outside period of SMA**
- **\*Distance, duration and speed subject to further analysis**





**30nm radius for  
SMA**

# **Economic and Vessel Traffic Management Analyses**

- **Economic Aspects of Right Whale Ship Strike Management Measures — Kite - Powell & Hoagland, 2002**
- **Vessel Traffic Management Scenarios Based on Recommended Measures to Reduce Ship Strikes of Northern Right Whales - Russell, Knowlton & Beaudin Ring, 2003**

# Vessel Traffic Characterization (US ACOE 1999)

		<i>Fall River</i>	<i>Providence</i>	<i>New London</i>	<i>New Haven</i>	<i>Bridgeport</i>
<i>dry bulk</i>	<i>handy</i>					
	<i>handymax</i>					
	<i>Panamax</i>	100	60	10	110	70
	<i>Cape</i>					
<i>tanker</i>	<i>product</i>					
	<i>Aframax</i>					
	<i>Suezmax</i>	10	110	25	110	30
	<i>VLCC</i>					
<i>container</i>	<i>1000 TEU</i>					
	<i>1500 TEU</i>					
	<i>2000 TEU</i>					
	<i>3000 TEU</i>					
	<i>4000 TEU</i>					
<i>LNG</i>						
<i>car carrier/RORO</i>						
<i>cruise</i>						
<i>tug/barge</i>	<i>dry</i>	20	60*	60*	150*	500*
	<i>tank</i>	20	370*	100*	560*	300*
<i>total</i>	<i>ships only</i>	110	170	35	220	100
	<i>ship&amp;barges</i>	150	*	*	*	*

Table 1b: Port calls by port and vessel type, estimated from USACE (1999).

\*Barge traffic in these ports is assumed to run mainly via Long Island Sound and thus is not subject to the right whale ship strike management measures considered in this report.

# **Providence Traffic** from ACOE data 1999; Kite-Powell & Hoagland, 2002

- **Port calls by ships ~170**
  - Tankers
  - Dry bulk
- **Port calls by tug & barges ~430**



# Vessel Traffic Characterization (US ACOE 1999)

		<i>NY/NJ</i>	<i>Philadelphia</i>	<i>Baltimore</i>	<i>Hampton Roads</i>
<i>dry bulk</i>	<i>handy</i>	570			
	<i>handymax</i>	270			
	<i>Panamax</i>	50	1,900	1,100	2,500
	<i>Cape</i>	20			
<i>tanker</i>	<i>product</i>	1,710			
	<i>Aframax</i>	650			
	<i>Suezmax</i>	70	1,100	160	430
	<i>VLCC</i>				
<i>container</i>	<i>1000 TEU</i>	1,400			
	<i>1500 TEU</i>	1,000			
	<i>2000 TEU</i>	1,000			
	<i>3000 TEU</i>	1,000	100	500	1,200
	<i>4000 TEU</i>	1,200			
<i>LNG</i>				100	
<i>car carrier/RoRo</i>		1,500			
<i>cruise</i>		550			
<i>tug/barge</i>	<i>dry</i>	600	2,200	1,700	4,000
	<i>tank</i>	1,000	5,000	1,800	860
<i>total</i>	<i>ships only</i>	<b>10,990</b>	<b>3,100</b>	<b>1,860</b>	<b>4,130</b>
	<i>ships&amp;barges</i>	<b>12,590</b>	<b>10,300</b>	<b>5,360</b>	<b>8,990</b>

Table 1c: Port calls by port and vessel type, estimated from USACE (1999).  
Additional information provided by the Port of New York and New Jersey.

# **NY/NJ Traffic** from 1999 ACOE data

- **Port calls by ships ~10,990**
  - Containers
  - Tankers
  - LNG
  - Dry bulk
  - Cruise
- **Port calls by tug & barges ~1600**

# Vessel Operating Speeds

- **Dry bulk - 14.5 knots**
- **Tanker - 14.5 knots**
- **Container – 24.0 knots**
- **Tug & barge - 12.0 knots**

# Additional Transit Time - Sea Speed to Maneuvering Speed

Table 1

Vessel Type or Category	Average Vessel Speed, knots	Additional Transit Time, $\Delta T_{VS-RS}$ , in minutes, for a vessel to slow from sea speed to maneuvering speed		
		10 Knot speed restriction	12 Knot speed restriction	13 Knot speed restriction
Dry bulk----	14	9	4	2
handy				
handymax	14	9	4	2
Panamax	14.5	9	5	3
Cape	14.5	9	5	3
tanker--product	14	9	4	2
Aframax	15	10	6	4
Suezmax	14.5	9	5	3
VLCC				
Containership--	15	10	6	4
1000TEU				
1500TEU	15	10	6	4
2000TEU	24	18	15	14
3000TEU	24	18	15	14
4000TEU	24	18	15	14
LNG	20	15	12	11
Car Carrier	16	11	8	6
Cruise ship	25	18	16	14
tug/barge--freight	12	5	0	0
--tank	12	5	0	0

Table 1 shows the average sea speed for various vessel types calling at US East Coast Ports (Kite-Powell and Hoagland, March 2002); and the additional transit time,  $\Delta T_{VS-RS}$ , as a function of proposed speed restrictions, for vessels to slow from sea speed to maneuvering speed. A vessel departing a DMA would also incur this

# Pilot Embarkation Points and Maneuvering Speeds Requested by Pilots for Boarding Russell et al, 2003; US Coast Pilots 2,3,4

Port Entrance	Pilot embarkation	Speed at Pilot Buoy, $V_{S_{PB}}$	Location of "Pilot Buoy" relative to harbor baseline or closing line
NY/NJ	Triangular cruising area west of Ambrose Light	No speed specified	6.8 nm
Delaware Bay	2.5nm SE of Cape Henlopen, DE	5 knots	2.5 nm
Chesapeake Bay	LWB "C"	No speed specified	2.85 nm

*Providence*

*no speed specified*

*est. 5 nm\**

\* Further analysis of vessel traffic for BIS, CCB, GSC funded in 2004 by NOAA Fisheries , NEIT

# Estimated Economic Impact – NY/NJ (\$424/ship call)

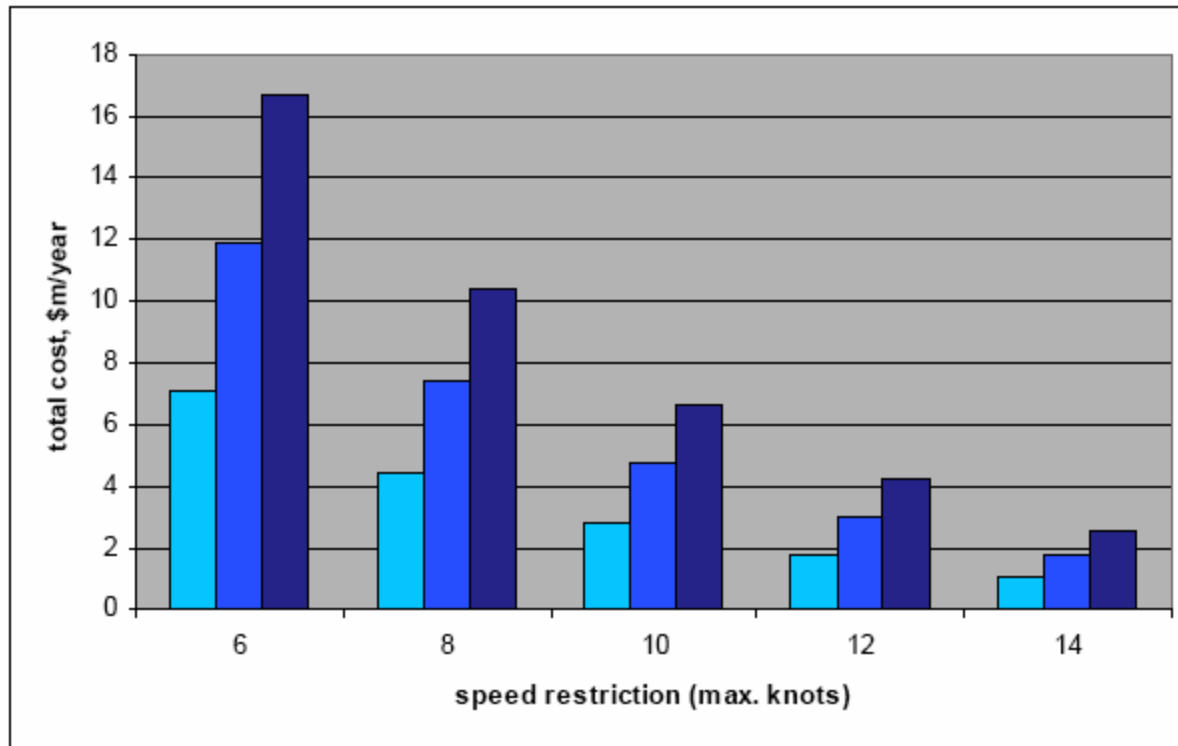


Figure 10: Annual operating cost increase due to speed restrictions for New York/New Jersey traffic.

Base case: 10 knots limit over 25 nm for 60 days/year: \$4,771,000.

Sensitivity analysis on effective distance and duration of speed restriction:

restriction in place 60 days/year, and	15 nm	25 nm	35 nm
speed restriction over 25 nm, and	36 days/year	60 days/year	84 days/year

# Additional Transit Times Based on 10,12,13 knots – NY/NJ

Ports of NY / NJ		Additional Transit Time, minutes @ RS = 10 Kts			Additional Transit Time, minutes @ RS = 12 Kts			Additional Transit time, minutes @ RS = 13 Kts		
Location of Pilot buoy @ 6.8nm		20nm	25nm	30nm	20nm	25nm	30nm	20nm	25nm	30nm
Vessel Category	Speed									
dry bulk—handy	14	25	28	33	17	15	16	13	10	9
Handymax	14	25	28	33	17	15	16	13	10	9
Panamax	14.5	26	30	36	18	17	19	14	12	12
Cape	14.5	26	30	36	18	17	19	14	12	12
Tanker—product	14	25	28	33	17	15	16	13	10	9
Aframax	15	28	32	39	19	19	22	16	14	15
Suezmax	14.5	26	30	36	18	17	19	14	12	12
VLCC										
Container-1000TEU	15	28	32	39	19	19	22	16	14	15
--1500TEU	15	28	32	39	19	19	22	16	14	15
--2000TEU	24	35	53	68	26	41	51	23	35	44
--3000TEU	24	35	53	68	26	41	51	23	35	44
--4000TEU	24	35	53	68	26	41	51	23	35	44
LNG	20									
Car Carrier	16	30	35	44	22	23	27	18	18	20
Cruise ship	25	35	54	69	26	42	53	23	37	46
tug/barge--freight	12	19	18	20	0	0	0	0	0	0
-----tank	12	19	18	20	0	0	0	0	0	0

Table 3a shows the additional time required with proposed speed restrictions of 10, 12 and 13 knots and proposed geographic extent of the management areas (SMA) of 20, 25 and 30 nautical miles for vessels calling at the ports of New York and New Jersey.

# NY & NJ – additional time with proposed speed restrictions

- Ranges from
  - Container 14 minutes @13 knots to 68 minutes @ 10 knots
  - Tanker 9 minutes @ 13 knots to 36 minutes @ 10 knots
  - Dry bulk 9 minutes @13 knots to 36 minutes @ 10 knots
  - Cruise 23 minutes @13 knots to 69 minutes @ 10 knots
  - Tug/barge only effected @ 10 knots



# Dynamic Management Areas (DMAs) 1998-2002 – Retrospective Analysis

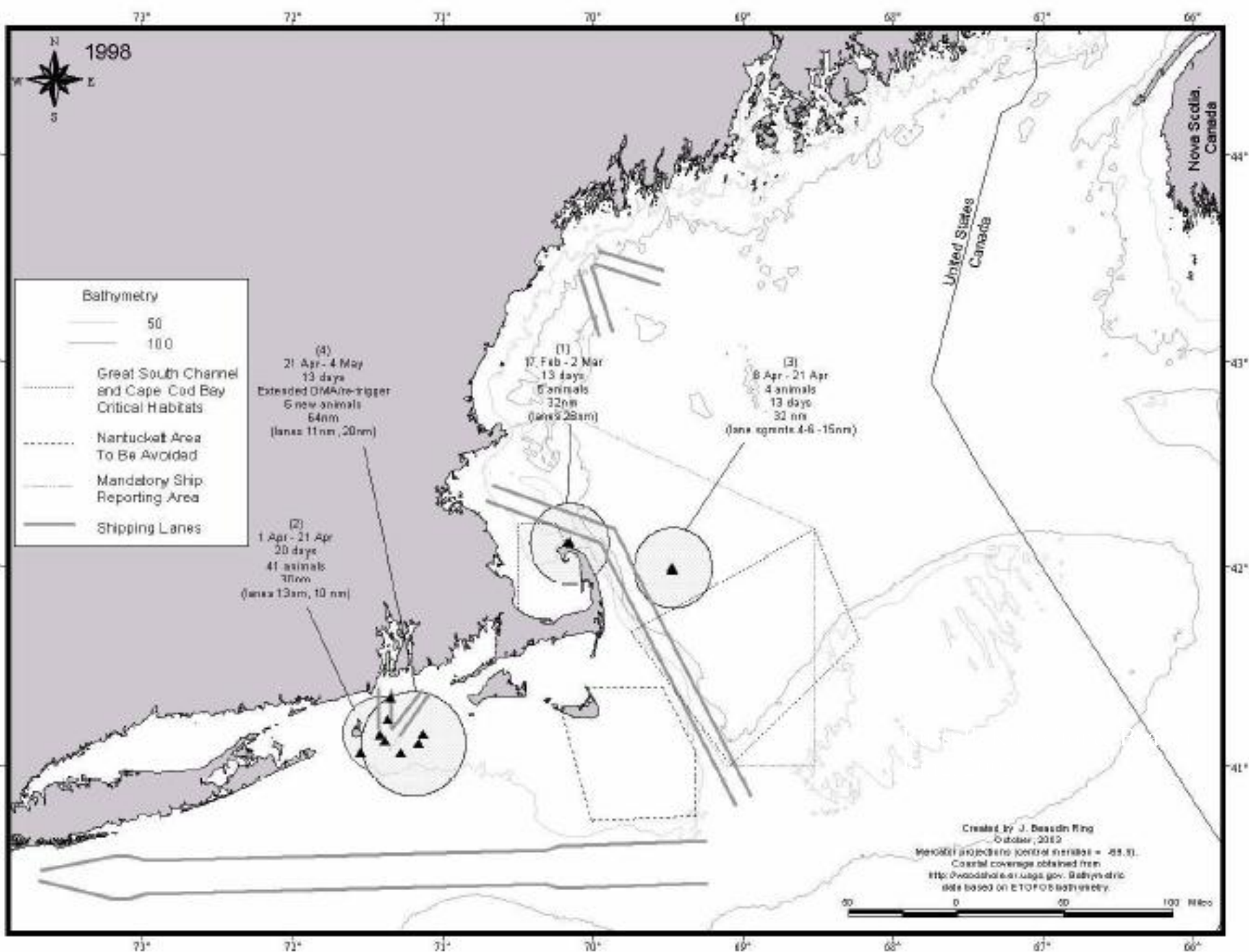
- From *Vessel Traffic-Management Scenarios Based on Recommended Measures to Reduce Ship Strikes of North Atlantic Right Whales* – a report submitted to the NMFS Northeast Implementation Team by B. Russell, A. Knowlton & J. Beaudin Ring, December 2003
- **Analysis of sightings from 1998 –2002** (& previous years)

# **Trigger Events For DMA per Russell, Knowlton & Beaudin Ring, 2003)**

- **Trigger Events :**
  - **3 or more animals**
  - **3 animals w/in 10 nm of each other**
  - **mother/calf pair w/in 15 nm of shipping lane**
  - **2 or more animals closer than 10 nm to each other w/in shipping lane if resident or feeding**
  - **1 or more animals in the Cape Cod Canal or any harbor area**

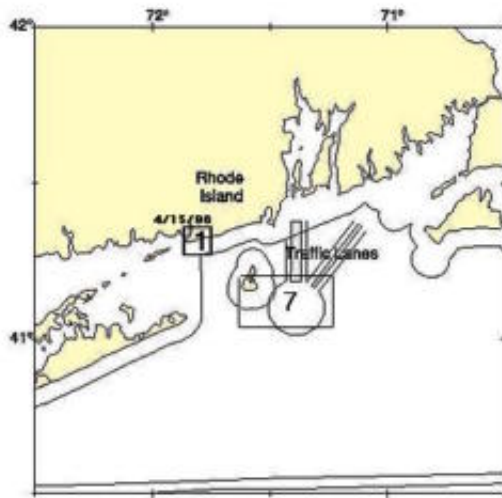
# **DMA**<sub>S</sub> (Russell et al, 2003)

- **Circle with 15nm radius around periphery of sightings**
- **13 day duration**
- **Addt'l sightings during the DMA in same area, period extended another 13 days**



Figure

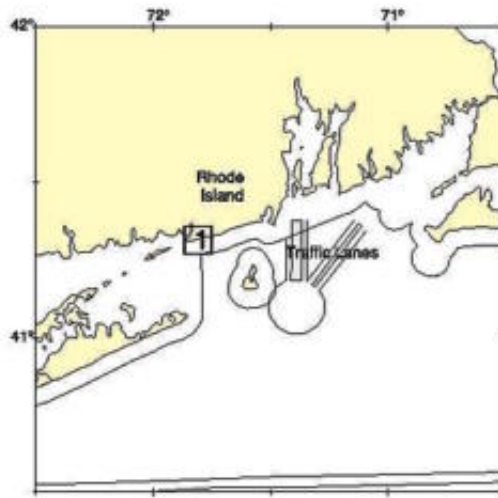
# Right Whale Sightings off BIS 1998



Right Whale Zone  
from Opportunistic Sighting,  
14 April 1998



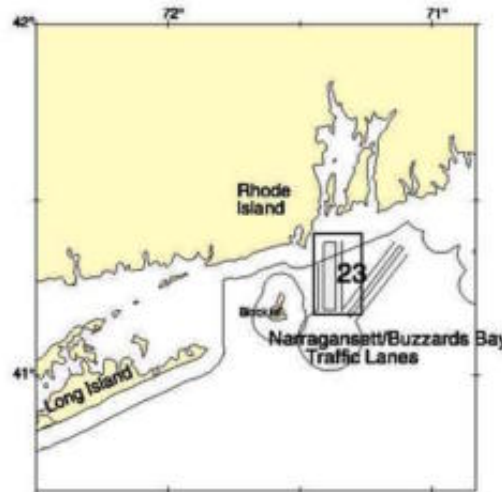
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Northeast Fisheries Science Center  
Woods Hole, MA



Right Whale Zone  
from Opportunistic Sighting,  
15 April 1998



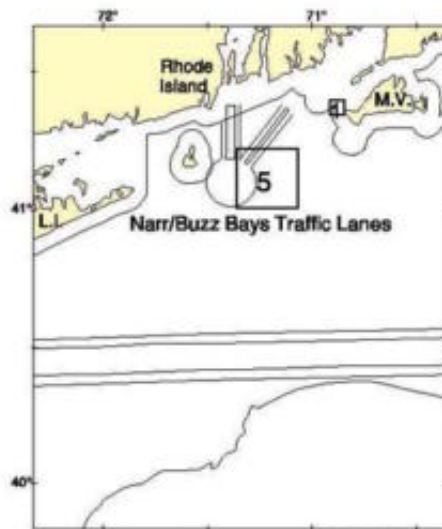
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Northeast Fisheries Science Center  
Woods Hole, MA



Right Whale Zones from  
CCS/MA & NMFS Aerial Surveys,  
19 April 1998



National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Northeast Fisheries Science Center  
Woods Hole, MA



Right Whale Zones  
from NMFS Aerial Survey,  
21 April 1998



National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Northeast Fisheries Science Center  
Woods Hole, MA

NOAA Fisheries SAS  
reports 1998

# 1998

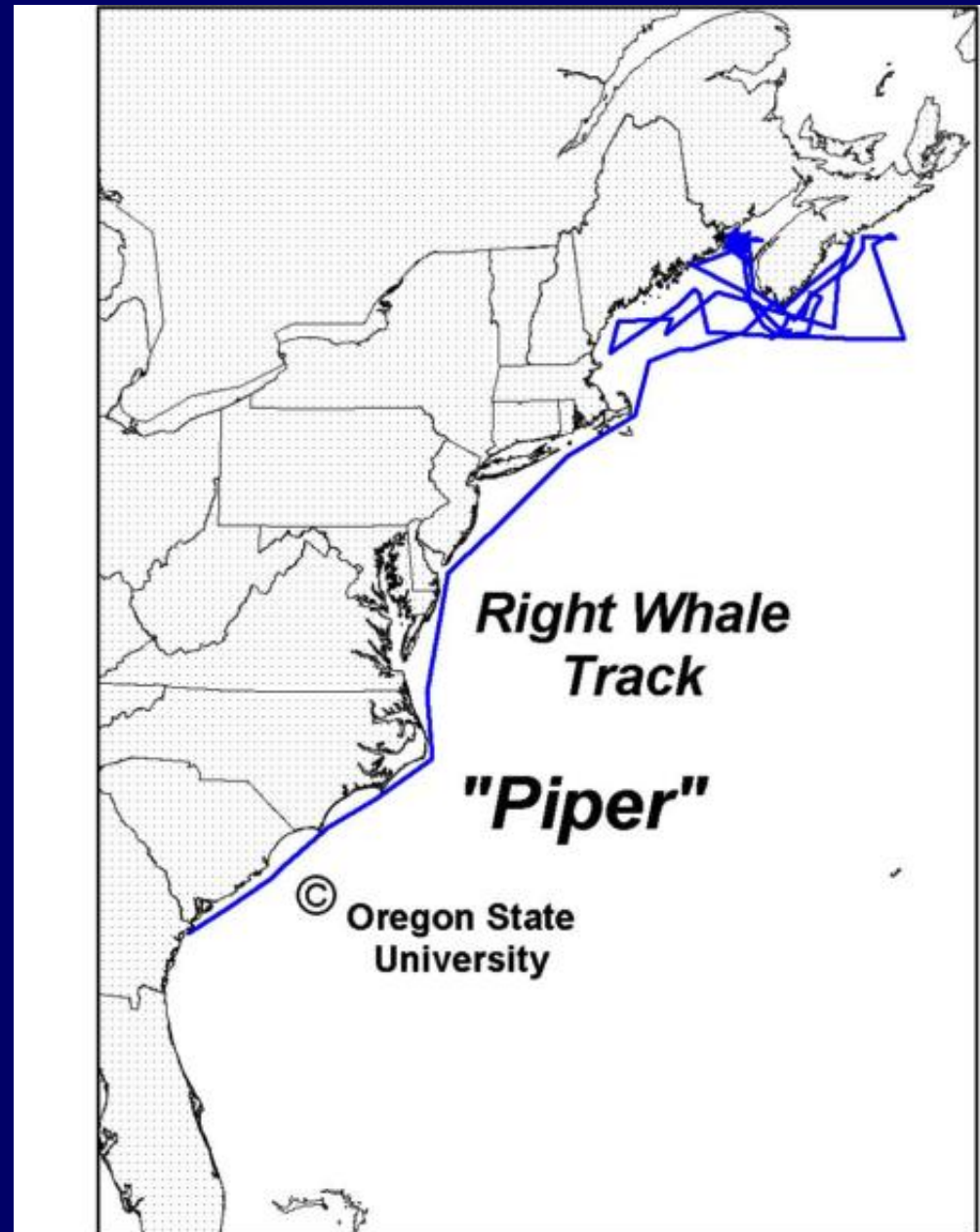
- **4 retrospective DMAs (Boston TSS, GSC/TSS & Providence)**
  - **Boston TSS (1) 17 Feb – 2 Mar**
  - **Providence (2) 1 Apr – 4 May**
  - **GSC/TSS (1) 8 –21 April**

# **Technology –A Small Snapshot of Ongoing Efforts**

- **Tagging**
- **Active and Passive Acoustics**

# Right Whale Tagged in 2001

- tag on female for approximately 5 months
- Whale traveled through most east coast TSS
- Sighted by aerial survey off GA at about time tag failed



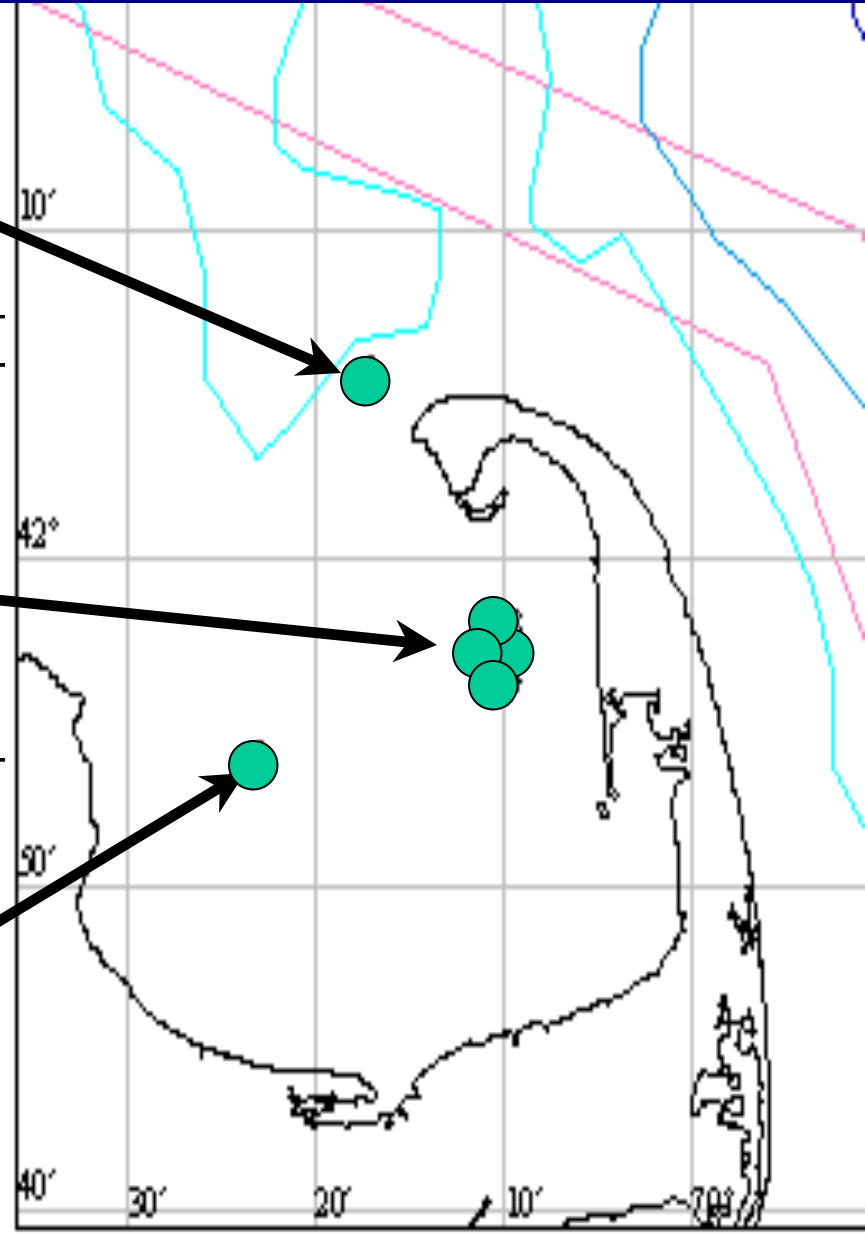
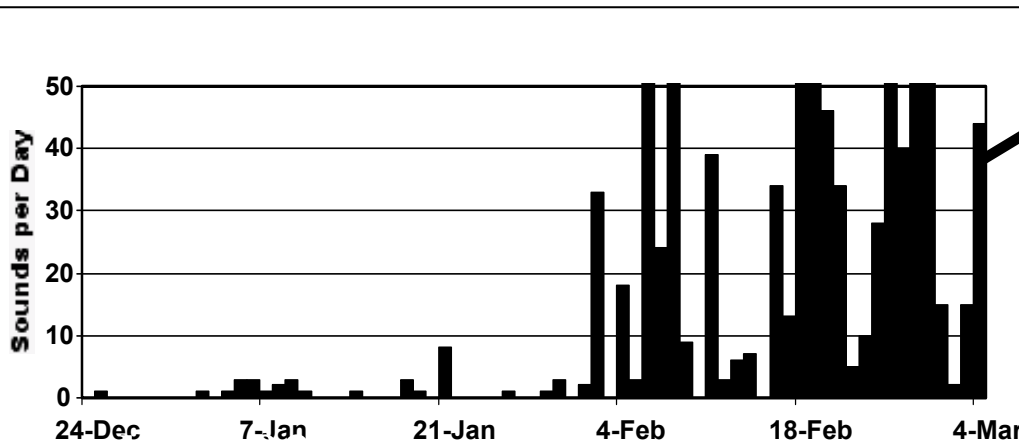
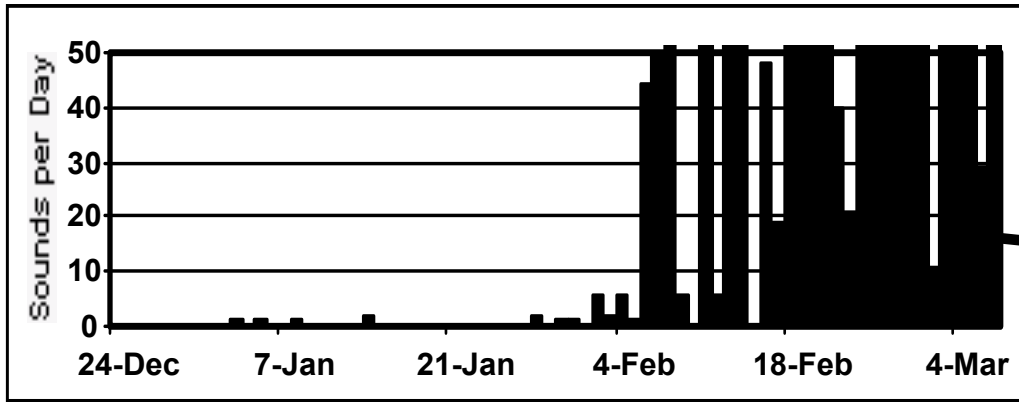
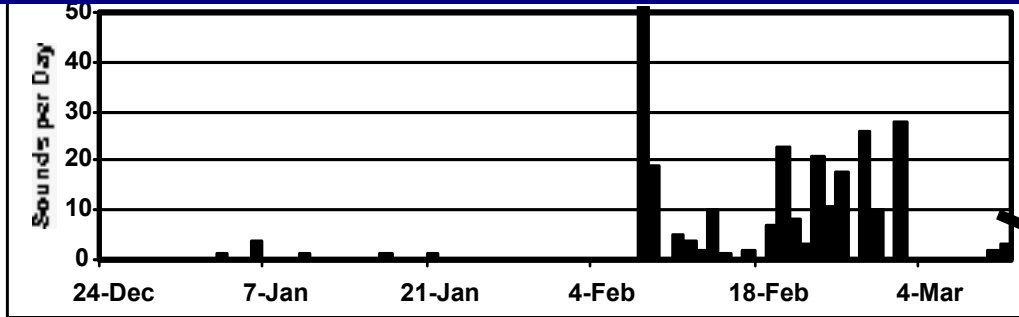


# Pop-up Sphere (17.5")



Clark, 2002

# Some pop-up detection results from Cape Cod Bay in 2002



# Summary

## Right Whale Acoustic Detection Research

- **There were dramatic differences between numbers and distributions based on acoustic detections for 2001 and 2002.** These differences were similar to those documented by aerial surveys and were probably related to food availability.
- **Passive acoustic monitoring is a realistic mechanism to reliably detect whales and to estimate distribution and relative abundance.** [For example, whales were detected acoustically in very low numbers (1-3 animals) throughout January 2002 in Cape Cod Bay, but were not detected during aerial surveys during this period (e.g. first whale heard on 25 Dec. 2001, but first whale seen on 7 Feb. 2002).]
- **Right whales are acoustically active throughout the year.** Technology is under development (field installation fall 2002) to automatically detect right whales in real-time in a remote area with shoreside Web access (e.g. GoMOOS).